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## **JSF High School**

Unique radiant slab heating and cooling system maximizes occupant comfort and HVAC system efficiency for Toronto-area school.

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# Toronto-area high school achieves comfort, energy efficiency goals with radiant heating and cooling



Part of the School Board Viamonde (Conseil Scolaire Viamonde), the *École secondaire Jeunes sans frontières (JSF)*, a French language high school, is dedicated to fostering an enriched, student-focused learning experience for its students. This includes providing a comfortable, healthy and sustainably designed learning environment, which was a primary focus of the school board and Robertson Simmons architects inc. during the construction of the more than 90,000 ft<sup>2</sup> (8,463 m<sup>2</sup>) Brampton, Ontario educational facility.

The building project, which earned the Canadian Green Building Council's LEED® Silver certification and was the first secondary school building to achieve LEED certification in Ontario, incorporated numerous elements of sustainable construction. These included unique indoor spaces integrated with outdoor landscapes, a green roof, maximized daylighting and displacement ventilation in both the 80,000 ft<sup>2</sup> (7,432 m<sup>2</sup>) school building and nearly 11,000 ft<sup>2</sup> (1,022 m<sup>2</sup>) professional training center. To maximize both occupant comfort and HVAC system efficiency, the project additionally incorporated a unique radiant slab heating and cooling system from REHAU.

"To help the school understand the exceptional benefits of a combined radiant heating and cooling system, we supplied a finite element analysis to model the floor construction and resulting floor heating and cooling output," explained Mark Euteneier, president of Klimatrol Environmental Systems, the project's REHAU technical associate and supplier. "The results of this analysis, when applied to energy usage calculations for the school, predicted a significant energy savings due to reduced heating/cooling loads and increased efficiencies of the heating and chilled water sources. Coupled with the system's comfortable, even method of heating and cooling, this analysis made in-floor radiant a must-have for the project."

Installed throughout the entire facility, including all classrooms, offices, and the cafeteria and gymnasium, the radiant heating and cooling system consisted of 104,700 ft (31,913 m) of RAUPEX 5/8-in. O<sub>2</sub> Barrier pipe and 42 PRO-BALANCE manifolds that were pre-piped with three-way valves into all recessed manifold distribution cabinets.

The RAUPEX pipe was installed at the ground level in a concrete-embedded, slab-on-grade design, using a counterflow spiral pattern to promote even surface temperatures. To accommodate cambered precast flooring on the second level, the RAUPEX pipe was affixed using RAILFIX™, then covered with a 2 to 3 in. (5 to 8 cm) concrete layer.

In addition to securing a meritorious LEED® Silver certification, the *École secondaire Jeunes sans frontières* building has also proven itself to be a comfortable, enjoyable learning space for its students. Moreover, the school has become a model for the School Board Viamonde's future building projects, and continues to note considerable energy cost savings.

**Project:** JSF High School, Brampton, Ontario

**Construction type:** School, opened in 2007

**Project scope:** 91,000 ft<sup>2</sup> (8,463 m<sup>2</sup>); 104,700 ft (31,913 m) of RAUPEX pipe

**Architect:** Robertson Simmons architects inc.

**Supplier and Designer:** Klimatrol Environmental Systems, Ltd

**REHAU systems used:** Radiant heating and cooling (RAUPEX® pipe, compression-sleeve fitting system, PRO-BALANCE® manifolds)

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